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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,926	09/11/2003	Hieronymus Andriessen	223996	6005

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LEYDIG VOIT & MAYER, LTD  
TWO PRUDENTIAL PLAZA, SUITE 4900  
180 NORTH STETSON AVENUE  
CHICAGO, IL 60601-6731

EXAMINER
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KOSLOW, CAROL M

ART UNIT	PAPER NUMBER
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1755

MAIL DATE	DELIVERY MODE
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05/17/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/659,926	Applicant(s) ANDRIESEN, HIERONYMUS	
	Examiner C. Melissa Koslow	Art Unit 1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 10-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/11/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/11/03, 9/29/03</u> | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1755

This applicants has an effective filing date of 12 September 2002 since the EP priority document, which is in English, provides support for the claimed subject matter. It is noted that the provisional application also provides support for the claimed subject matter.

The articles cited in the information disclosure statement filed 11 and 29 September 2003 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the required titles for the articles are not given in the citations. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

The articles will be considered once the citations meet the requirements of 37 CFR 1.97, 1.98 and MPEP § 609.

The Japanese reference, cited in the information disclosure statement of 11 September 2003, has been considered with respect to the provided English abstract.

Applicant's election with traverse of Group I and the species of claims 1-9 in the reply filed on 5 March 2007 is acknowledged. The traversal is on the ground(s) that it is not a serious burden to search all the Groups and the Examiner did not set forth sufficient reasons there is a serious burden. This is not found persuasive because the different classification of each groups is *prima facie* evidence of serious burden. In addition the art applied to group I would not likely be applicable to groups II and III; the search for group I requires a different field of search than

Art Unit: 1755

groups II and III; the art applied to group II would not likely be applicable to group III and the search for group II require a different field of search than group III.

It appears applicants did not argue the election of species requirement. The explained differences in the species election on page 4 of the action shows there is a serious burden to search each species, since they show each group requires a different field of search. It is also noted that that prior art applicable to the nanoparticles is not applicable to dispersions, layers and photovoltaic devices.

The requirement is still deemed proper and is therefore made FINAL.

Claims 10-24 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by the article by Guglielmi et al.

This article teaches quantum dots, which are nanoparticles, having the formula  $(\text{Pb}_x\text{Cd}_{1-x})\text{S}$ , where x is 0.3 and 0.1. These nanoparticles have a particle size in the range of 3-8 nm, which is between the size of the taught PbS particles and the CdS particles, and are produced through coprecipitation. Page 232 teaches the particles comprise PbS and CdS phases. The taught nanoparticles exhibits luminescence different from that of CdS quantum dots and thus the lead also acts to spectrally sensitize the particles. The taught particles teach those claimed.

Art Unit: 1755

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the article by Guglielmi et al.

This article teaches quantum dots, which are nanoparticles, having the formula  $(\text{Pb}_x\text{Cd}_{1-x})\text{S}$ , where  $x$  is 0-1, which encompasses the claimed range. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960).

These nanoparticles have a particle size in the range of 3-8 nm, which is between the size of the taught PbS particles and the CdS particles, and are produced through coprecipitation. Page 232 teaches the particles comprise PbS and CdS phases. The taught nanoparticles exhibits luminescence different from that of CdS quantum dots and thus the lead also acts to spectrally sensitize the particles. The taught particles suggest those claimed.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 7,008,559.

This reference teaches manganese doped up-conversion luminescent chalcogenide nanoparticles, having a particle size of less than 100 nm, which overlaps the claimed range. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182

Art Unit: 1755

USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The manganese acts to spectrally sensitize the metal chalcogenide. The taught particles have the formula  $(M_{1-z}N_z)_{1-x}Mn_xA$ , where A is one or two chalcogenides selected from S, Se, Te and O,  $0 < x \leq 1$ ,  $0 < z \leq 1$ , M can be Zn or Cd and M can be Pb (col. 9, lines 24-28). Thus the reference suggests  $(Zn_{1-z}Pb_z)_{1-x}Mn_xS$  and  $(Cd_{1-z}Pb_z)_{1-x}Mn_xS$ . Lead sulfide and either cadmium sulfide or zinc sulfide have low solubility in each other and therefore would form a two phase particle in the overlapping range. The reference suggests the claimed nanoparticles.

Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

There is no teaching or suggestion in the cited art of record of nonstoichiometric mixed metal chalcogenide nanoparticles, where the particles are deficit in the amount of chalcogenide.

The article by Zbinden et al is cited as of interest since it teaches clusters of nanocrystals of  $(Zn_{0.88}Fe_{0.12})S$ , having a particle size of 1-5 nm. These clusters are not nanoparticles, based on applicants' explicit definition given on page 6 of the specification. U.S. patent 6,602,731 is cited as of interest since, while it teaches the claimed nanoparticles, it is not prior art and the claimed and patented method does not teach or suggest the claimed nanoparticles.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.

Art Unit: 1755

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cmk  
May 11, 2007



C. Melissa Koslow  
Primary Examiner  
Tech. Center 1700